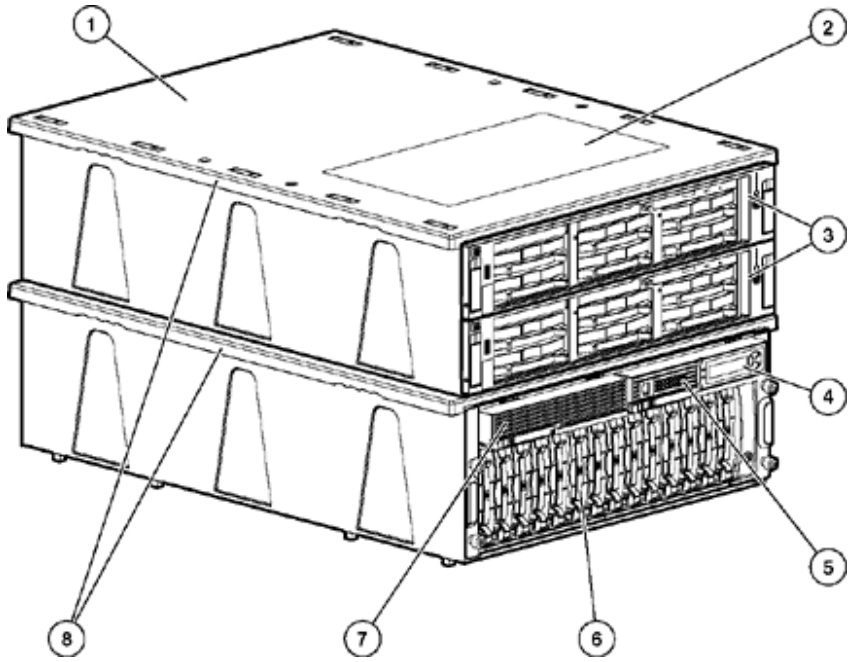
Overview



1. Configuration Fixture
2. Cluster Component Label
3. Two 2U Servers
4. MSA1000 Controller
5. MSA1000 LED
6. 4U MSA1000 Shared Storage with 14 1" Hot Plug Hard drives Bays
7. Redundant MSA1000 Controller Bay
8 Lifting Rails

At A Glance

- Features (2) DL380 G4 3.4 GHz Servers
- Now features the HP StorageWorks Modular Smart Array 1000 (MSA1000) storage system
- Now features the MSA1000 SAN Switch 2/8
- Now features (2) HP 2 Gb Fibre Channel Host Adapters (FCA2214)
- Now supports U320 SCSI 10K and 15K rpm Universal Hard Drives

The HP ProLiant DL380 G4 Packaged Cluster with MSA1000 is a member of the ProLiant Packaged Cluster Family and extends the current product lineup with the addition of the HP StorageWorks Modular Smart Array 1000 storage system (MSA1000). The MSA1000 is the premiere storage system in the HP StorageWorks Modular Smart Array family, delivering industry-leading technology to meet today's demanding and growing storage needs. These server and storage solutions offer the best price performance features for direct attach environments, small clusters, and entry-level and mid-range SAN environments. Each solution is designed to simplify and accelerate deployment as well as to maximize transfer rates, reduce management costs, while driving rapid return on investment.

The DL380 G4 Packaged Cluster with MSA1000 combines the power and reliability of the ProLiant DL380 G4 server with the high performance and scalability of the MSA1000 storage system. This powerful combination is uniquely joined the Package Cluster 8U fixture which is designed to simplify and accelerate system deployments for standard or clustered system configurations. In standard configurations, the DL380 G4 Packaged Cluster with MSA1000 offers the convenience of pre-installed storage and server components in a single package. The innovative shipping box for the G4 Packaged Cluster with MSA1000 simply opens and allows for quick setup while leaving the servers and storage readily accessible in the Packaged Cluster 8U fixture. Colorful configuration and setup guides quickly explain the process of connecting storage, networking and power cables. Once initial setup has been completed, the G4 Packaged Cluster with MSA1000 may be quickly re-packaged for deployment at another site or facility, or simply remove from the 8U Packaged Cluster fixture and installed in an HP rack with the enclosed universal rail kits.

The MSA1000 combines the array controller shelf and the drive shelf, which holds up to fourteen 1" universal disk drives in a single 4U rack-mount cabinet. More storage can be easily deployed with the addition of up to two HP StorageWorks MSA30 disk enclosures with space for forty-two drives giving maximum storage capacity of 12.6 TB when using the new 300 GB drives. The MSA1000 provides the latest 2 Gb Fibre Channel technology to the hosts. Uniquely offered standard in the DL380 Packaged Cluster with MSA1000 is the 8-port, 2 Gb Fibre Channel fabric switch providing maximum performance and scalability with ease and simplicity of the ProLiant Packaged Cluster Family. The 8-port, 2 Gb Fibre Channel fabric switch conveniently fits inside the MSA1000, a second 8-port, 2 Gb Fibre Channel fabric switch may be added for additional protection and redundancy. The MSA1000 provides Ultra3 SCSI connections to the hard drives and uses the HP Universal 1" Ultra2, Ultra3, and Ultra320 drives. By utilizing existing SCSI drives, the MSA1000 lowers the total cost of ownership and extends the customer's hardware investments into the future. The MSA1000 can be remotely managed by using management tools such as HP Insight Manager, Array Configuration Utility and the StorageWorks Fabric Switch Management Utility depending on the host's operating system.

The DL380 G4 Packaged Cluster with MSA1000 may be used with Microsoft® Windows® Server 2003, Windows 2000 and Linux operating systems for standard and clustered configurations. The performance and scalability of the MSA1000 allows for up to 18 additional ProLiant servers to be connected

Overview

providing maximum return on investment and minimal storage management costs.
All notes in this QuickSpecs reference the Microsoft, NetWare, and Linux capabilities and options.

- Two DL380 G4 Servers (1 processor per server) plus the MSA1000 storage system combined in a 8U configuration fixture

2-DL380 G4 (per server) features:

- Integrated Lights-Out (iLO) Management standard on system board
- Intel Xeon 3.4 GHz processors with 64-bit extensions, a 800MHz Front Side Bus and 1MB of L2 cache
- Intel E7520 Chipset
- Integrated Ultra320 Smart Array 6i Plus Controller with 64MB RAM and optional 128MB Battery-Backed Write Cache (BBWC) Enabler option kit
- Three available 64-bit PCI-X slots, including two non-hot pluggable 100MHz slots and one non-hot-pluggable 133MHz slot and optional PCI-X Hot-Plug cage and Optional PCI-E Non-hot plug Cage (2) x 4
- NC7782 Dual Port PCI-X Gigabit Server Adapter (embedded)
- Support for up to six 1" Wide Ultra3/Ultra320 SCSI hot plug hard drives or for five hot plug hard drives and one DAT hot plug tape drive
- Optional dual channel drive backplane
- Internal hot plug capacity 1.800 TB standard (6 x 300 GB 1" HD)
- 575-Watt Hot Plug Power Supply (with optional redundancy)
- Hot Pluggable Fans (with optional redundancy)
- Quick Deploy Rail System includes sliding universal rails and an ambidextrous cable management arm for easy serviceability and in-rack tool-less access to major components
- USB 2.0 support one port up front and two port in back
- Automatic Server Recovery (ASR), ROM Based Setup Utility (RBSU), HP System Insight Manager, Status LEDs including system health and UID and SmartStart

1 MSA1000 Storage:

- 4U Rack Mount Fibre Channel Storage, and one MSA1000 controller (redundant optional)
- Support for HP Ultra2, Ultra3, and Ultra320 Universal 1" Drives
- 14 hot plug drive bays, up to 2 TB storage (with 146 GB drive)
- Scaleable up to 12.6 TB of storage (42 x 300 GB drives) via HP StorageWorks Modular Smart Array 30 (MSA30) disk enclosures (each MSA30 provides 14 hot plug drive bays)
- 2 Gb Fibre Channel host connections (support for 1 Gb and 2 Gb Fibre Channel fabrics)
- Embedded 8-port 2 Gb Fibre Channel Fabric Switch (redundant optional)
- RAID-ADG (Advanced Data Guarding)
- Battery-Backed 256-MB cache, upgrade to 512-MB cache
- Hot Plug redundant power supplies and fans
- Compatible with ISV backup and restore software from Hewlett Packard, VERITAS and others
- Tool-less rack-rail included supports round and square hole racks
- Protected by HP Services, including a three-year, Next Business Day, on-site limited Global warranty and extended Pre-Failure Warranty, which covers processors, memory, and hard drives - Certain restrictions and exclusions apply. Consult the HP Customer Support Center at 1-800-345-1518 for details.

Standard Features (DL380 Generation 4 Packaged Cluster with MSA1000)

Packaging

8U Configuration Fixture - Recyclable ABS material

Unique cabling with positive identification (secured to storage configuration fixture)

Two 5 meter Fibre Channel cables

One 6 foot Ethernet cross over cables

Documentation

Cluster set-up poster and configuration guide

Server

ProLiant DL380 G4 Server (Qty 2)

Shared Storage

Modular Smart Array 1000 (Qty 1)

Software Components

The Packaged Cluster utilizes a single, consistent set of utility software for storage and RAID management, setup, configuration and troubleshooting. This consistency reduces the cost of ownership by reducing the training and technical expertise necessary to install and maintain your HP server storage solution.

Configuration

- Array Configuration Utility (ACU) [On-line/Offline]
- Array Configuration Utility (ACU 6) [On-line, Remote Web-Based & Off-line]
- Option ROM Configuration for Arrays (ORCA)
- Selective Storage Present (SSP)
- ROM based set-up Utility (RBSU)

Management/Health

- HP Systems Insight Manager
- Smart Start
- Management Agents
- Redundant ROM
- Remote Flash ROM
- Integrated Lights-Out Support
- Remote Insight Lights-Out Edition
- Automatic Server Recovery (ASR)
- Active Update
- ROMPaq, support software and configuration utilities
- Survey Utility and diagnostics utilities
- Drive Parameter Tracking
- Dynamic Sector Repairing
- Hot Spare Boot
  (NOTE: Upon the event of a failed processor or VRM in a multi-processing environment, the system will automatically reboot and use the remaining good processor(s).)
- Pre-Failure Notification (covers processors, hard drives and memory)
- Optional ProLiant Essentials Value Packs: Rapid Deployment Pack, Workload Management Pack, Integrated Lights Out

Standard Features (DL380 Generation 4 Packaged Cluster with MSA1000)

OS Support

Microsoft Cluster Service (MSCS)

- Microsoft Windows NT Server, Enterprise Edition 4.0
- Microsoft Windows 2000 Advanced Server
- Microsoft Windows 2003 Server, Enterprise Edition

LifeKeeper for Linux

- Red Hat Enterprise Linux 2.1 & 3.0
- SUSE Linux Enterprise Server 8 & 9

ServiceGuard for Linux

- Red Hat Enterprise Linux 2.1 & 3.0
- SUSE Linux Enterprise Server 8 & 9

NOTE: For a more complete and up-to-date listing of supported OSs and versions, please visit our OS Support Matrix at: http://www.hp.com/go/supportos.

NOTE: Please refer to compatibility matrix http://www.hp.com/products/sharedstorage for latest compatibility information.

NOTE: For a more complete and up-to-date information on Linux support, please visit HP Linux Web site at http://h18000.www1.hp.com/products/servers/linux/hpLinuxcert.html.

NOTE: For more complete and up-to-date information on how to buy server operating systems from HP please visit the OS product site at: http://h18004.www1.hp.com/products/servers/software/OEM.html

Service and Support

Three-year limited warranty, including hardware diagnostic support, pre-failure warranty (coverage of hard drives, memory and processors). The warranty is fully supported by HP Services and a worldwide network of resellers and service providers. In addition 90-day's getting started software telephone support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services.

NOTE: Limited warranty includes 3 year parts, 3 year labor, 3-year on-site support

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Education courses
- Extended onsite hardware coverage hours from same business day 13 hours, 5 day to 24 hours, 7 days call window with options including 4-hour response or 6-hour Call To Repair
- Comprehensive range of software technical support for Microsoft, Linux, ProLiant Essentials and VMWare-based IT solutions helping to deliver high level of application availability. Response times range from 30 mins for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

HP Care Pack Services include HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the enclosure, as well as 22" and smaller external monitors and tower UPS options up to 3KVA. 22" and smaller external monitors will be covered at the same service level and coverage period as the server. For servers or storage systems installed within a rack, service also covers all HP qualified rack options installed within the same rack.

NOTE: For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: http://www.hp.com/hps/carepack

NOTE: For more complete information on HP Services offerings, customers and resellers, please visit us at: http://www.hp.com/hps

NOTE: Additional information regarding worldwide limited warranty and technical support is available at: http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html

Standard Features (DL380 Generation 4 server)

Processor (per server)	Intel Xeon Processor 3.4 GHz-1MB				
Cache Memory (per processor)	1M second level ECC cache (full speed)				
Upgradability (per server)	Upgradable to dual processing				
Chipset (per server)	Intel E7520 Chipset NOTE: For more information regarding Intel, please see the following URL: http://www.intel.com/products/server/chipsets/.html.				
Memory (per server)	Standard	1 GB of 2-way interleaved capable PC2-3200 DDR2 SDRAM running at 400 MHz, with Advanced ECC capabilities and online spare capabilities			
	Maximum	12 GB			
Network Controller (per server)	NC7782 Dual Port PCI-X Gigabit Server Adapter (embedded)				
Expansion Slots (per server)	**I/O** (3 Total, 3 available)	**Bus Number**	**Device Number**	**PCI Voltage:**	
	64-bit/133 MHz PCI-X , Non Hot Plug	10	1	3.3 Volt or universal cards	
	64-bit/100 MHz PCI-X, Non Hot Plug	6	1	3.3 Volt or universal cards	
	64-bit/100 MHz PCI-X, Non Hot Plug	6	2	3.3 Volt or universal cards	
	*NOTE: Default bus assignment. Inserting cards with PCI bridges may alter the actual bus assignment number. **NOTE: Slots are enumerated differently based on OS. MS OS's enumerate from lowest to highest Device ID by bus (starting with the lowest bus). NOTE: For more information regarding PCI-X, please see the following URL: http://h18004.www1.hp.com/products/servers/technology/pci-x-qa.html NOTE: All slots can accept universal keyed PCI cards				
Storage Controllers (per server)	Smart Array 6i Controller (Ultra320) (integrated on system board) FCA2214 Host Adapter (Linux & 32-bit Windows) (1 per server for connectivity to the MSA1000) NOTE: For complete list of devices supported the Smart array 6i Controller see the following: http://h18000.www1.hp.com/products/quickspecs/12030_div/12030_div.HTML (Worldwide) http://h18000.www1.hp.com/products/quickspecs/12030_na/12030_na.HTML (North America)				
Storage (per server)	Optical Drive	24x IDE CD-ROM Drive (Slimline)			
	Hard Drives	None			
	Maximum Internal Storage	1.80 TB (6 x 300 GB Ultra320 1")			

Standard Features (DL380 Generation 4 server)

Interfaces (per server)	Serial	1
	Pointing Device (Mouse)	1
	Graphics	1
	Keyboard	1
	External SCSI	1
	2 Gb Fibre Channel	1 (via FCA2214 Host Adapter, occupies one PCI slot in the server)
	Network RJ-45	3 (1 for iLO)
	USB	2 NOTE: Please see the following URL for additional information regarding USB support: http://h18004.www1.hp.com/products/servers/platforms/usb-support.html.
Graphics (per server)	Integrated ATI Rage XL Video Controller with 8-MB SDRAM Video Memory	
Form Factor (per server)	Rack (2U), (3.5-inch)	
ProLiant Essentials Foundation Pack Software	HP Systems Insight Manager	HP's new HP Systems Insight Manager (HP SIM) helps maximize system uptime and performance and reduce system maintenance costs by providing proactive notification of problems before those problems result in unplanned downtime or reduced productivity. HP SIM are both easy to set up work with the Insight Management Agents, integrated Light-Out and Remote Insight Light-Outs Edition, and Version Control Agents to deliver robust fault, configuration, and asset management as well as remote administration. With HP SIM customers will also be able to take advantage of role-based security; the ability to manage ProLiant, Integrity, and HP 9000 systems; and plug-ins for storage, client, printer, and power management as well as server rapid deployment, performance management, and workload management. For more details on HP SIM visit http://www.hp.com/go/hpsim.
	SmartStart	SmartStart is a tool that simplifies server setup, providing a rapid way to deploy reliable and consistent server configurations. For more information, please visit the SmartStart Web site at http://www.hp.com/servers/smartstart. SmartStart version supported (minimum): SmartStart 7.10.
	Management Agents	The Management Agents form the foundation for HP's Intelligent Manageability strategy. They provide direct, browser-based access to in-depth instrumentation built into HP servers, workstations, desktops, and portables, and send alerts to Insight Manager 7 and other enterprise management applications in case of subsystem or environmental failures. For additional information about the Management Agents and other management products from HP, please visit the management Web site at http://www.hp.com/servers/manage.
	Subscriber's Choice	Subscriber's Choice Driver and Support Alerts/Notifications is a web-based email subscription service that provides automatic delivery of software and driver change notifications for ProLiant products. Sign up at http://www.hp.com/go/subscriberschoice and customize your profile to receive various new alerts as they become available, on a weekly or monthly basis.
	ROMPaq, support software, and configuration utilities	The latest software, drivers, and firmware fully optimized and tested for your ProLiant server and options available in SmartStart or downloadable from Software and Drivers download pages, linked from the SmartStart website at http://www.hp.com/servers/smartstart.
	Insight Diagnostics Online Edition	The most advanced configuration analysis, reporting and troubleshooting utilities used by HP and at your fingertips, available in SmartStart.

Standard Features (DL380 Generation 4 server)

Industry Standard Compliance	ACPI 1.0b Compliant PCI-X and PCI 2.2 Compliant WOL Support Microsoft® Logo certifications USB version 1.1
Security	Power-on password Keyboard password Diskette drive control Diskette boot control QuickLock, Network Server Mode Serial interface control Administrator's password Disk configuration lock
Server Power Cords	Four (4) total Lowline power cords ship standard (per cluster) – US, Japan, Europe. Sixteen (16) total Lowline power cords ship standard (per cluster) – APD, GCD, PRC
Power Supply (per server)	575 Watt, CE Mark Compliant Optional Hot Plug Redundant Power Supply Capability
System Fans (per server)	Each server node contains 5 hot plug fans standard. An optional fan upgrade kit consisting of 3 additional hot plug fans for dual processor configurations. Hot Plug Redundant Fan Option Kit is available.
Required Cabling	For required cabling information, refer to the HP Web site at: http://h18000.www1.hp.com/products/servers/ProLiantDL380/.

Rack Airflow Requirements

Rack 10000 series Cabinets

The increasing power of new high-performance processor technology requires increased cooling efficiency for rack-mounted servers. The 10000 Series Racks provide enhanced airflow for maximum cooling, allowing these racks to be fully loaded with servers using the latest processors.

CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: If your 42U server rack includes closing front and rear doors, you must allow 830 square inches (5,350 sq cm) of hole evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64 percent open area for ventilation).
- Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 2.75 inches (7 cm).

CAUTION: Always use blanking panels to fill all remaining empty front panel U-spaces in the rack. This arrangement ensures proper airflow. Using a rack without blanking panels results in improper cooling that can lead to thermal damage.

NOTE: For additional information, refer to the Setup and Installation Guide or the Documentation CD provided with the server, or to the server documentation located in the Support section at the following URL: http://h18000.www1.hp.com/products/servers/ProLiantdl760/index.html.

Rack Kit (Servers)	Tool-Free support for racks with square mounting holes (including Compaq/HP 7000, 9000, 10000 and H9 series), with an adjustment range of 24" - 36". NOTE: The Modular Smart Array 1000 tool-less rack rail included in the Packaged Cluster accommodates most round or square hole rack standard.

Standard Features (Modular Smart Array 1000)

With the following components, your storage capacity and performance can be scaled to new levels:

Modular Smart Array 1000 The 4U cabinet houses up to fourteen 1" Universal hot pluggable Ultra2, Ultra3, and/or Ultra320 drives. Each MSA1000 includes the following standard components: (1) MSA1000 Controller, (1) MSA Fibre Channel I/O Module with a single SFP, dual hot pluggable fans/power supplies and power cables, (2) 3' VHDCI to VHDCI SCSI cables to connect expansion enclosures, documentation and a support software CD.
The modular design of the MSA1000 makes it possible to add redundant controllers, redundant single port Fibre Channel I/O Modules, 3-port hub, or embedded fabric switches and storage expansion enclosures. Additional storage enclosures may be added without power cycling the MSA1000.

MSA1000 Controller

The MSA1000 Controller is an integrated RAID controller with an LCD/LED status display and 256 MB read/write battery-backed cache (expandable to 512 MB per controller). One MSA1000 Controller is included with the MSA1000; a redundant MSA1000 Controller is an option.

Key Features

- Redundant controller support with mirrored cache
- Fabric, Private Loop & Public Loop Support
- Auto Negotiated F, FL & L Port Login
- RAID 0, 1, 1+0, 5 and ADG
- 2 Gb/1 Gb Frequency Agile
- Primary & Secondary Inter-Controller Link (ICL)
- Host based configuration via ACU
- Optionally configurable with Command Line Interface (CLI)
- Remote configuration and monitoring via ACU (offline and remote) & IM

MSA1000 Controller Management Features

- **Selective Storage Presentation:** allows multiple hosts to access a single MSA1000 storage system. Host access can be defined all the way down to a logical volume level.
- **Online RAID Level Migration:** allows for online post-configuration change to RAID level without destroying data or volume information.
- **Online Capacity Expansion:** lets you add storage to an operational MSA1000-reducing expensive server downtime.
- **Global Online Spare:** reduces the risk of data loss by facilitating automatic rebuilds after a drive failure.

Fault Tolerance

Several fault tolerant configurations which keep data available and servers running while drives are being replaced are supported including:

- Advanced Data Guarding (RAID ADG): Allocates the equivalent of two parity drives across multiple drives and allows simultaneous write operations.
- Distributed Data Guarding (RAID 5): Allocates parity data across multiple drives and allows simultaneous write operations.
- Drive Mirroring (RAID 1, (1+0 Striped Mirroring)): Allocates half of the drive array to data and the other half to mirrored data, providing two copies of every file.

Fault Recovery

Minimizes downtime, reconstructs data, and facilitates a quick recovery from drive failure:

- Online Spares: If a failure occurs, recovery begins with an online spare and data is reconstructed automatically. Multiple online spares can be assigned per array and used across multiple arrays. It is also possible to assign different online spares across different arrays.
- Array Accelerator: Onboard, battery-backed cache memory protects data in the event of a power failure. In the unlikely event of a controller failure, the battery-backed cache will save critical user data for up to three days.

Standard Features (Modular Smart Array 1000)

Storage	**Drive bays**	14 1" Hot pluggable
	Drive bays scalability	Up to 42 hot pluggable drive bays via two MSA30 disk enclosures (14 drive bays per MSA30)
	Hard Drives	None
	Maximum Internal Storage	Base MSA1000: 4.2 TB (14 x 300 GB Ultra320 1")
		With one MSA30: 8.4 TB (28 x 300 Ultra320 1")
		With two MSA30: 12.6 TB (42 x 300 GB Ultra320 1")
	Hard Drive	Pre-failure warranty

Storage Standard Contents	4U Modular Smart Array 1000 (1) MSA1000 Controller with 256 MB cache (1) MSA SAN Switch 2/8 (integrated) (Includes four 2Gb SFPs) Redundant hot pluggable power supply/fans Redundant Hot Pluggable Power Supply/blower assemblies Universal Rack-mounting Kit (2) Power cables MSA1000 Support CD & Documentation Ethernet Crossover cable for clustering Serial cable (2) 3-ft VHDCI to VHDCI SCSI cables NOTE: The MSA SAN Switch 2/8 has a total of eight Fibre Channel ports. There are seven ports accessible by the user and the eighth is internal to the controller. Four SFPs are shipped installed in the Switch.
Storage Controller	MSA1000 Controller, redundant controller capable
Host Bus Adapters	FCA2214 Host Adapter (Linux & 32-bit Windows) (one per server)
Cache Memory	256 MB Read/Write Cache Up to 512 MB Read/Write Cache (optional) ECC protection, battery backed, removable NOTE: Optional storage memory allows the following configurations: 1x128 MB, 2x128 MB, 1x256 MB, 2x256 MB. NOTE: When redundant controllers are installed, the cache configurations in both controllers must be identical.
Cache Batteries	Up to three days of redundant battery life, removed for easy replacement
Upgradable Firmware	2 MB flashable ROM
Power Supply	499 Watt (Dual) Power Supply, CE Mark Compliant Fans integrated into each power supply, Redundant Functionality (Standard)
Disk Drive and Enclosure	Ultra320, Ultra3 and Ultra 2 SCSI 1 inch Universal drives
Form Factor	Rack 4U, (7.0 inch)

Standard Features (Modular Smart Array 1000)

Connector Type	2 Gb or 1 Gb Fibre Channel
Ports	2 VHDCI; Ultra3 SCSI
Bandwidth	>200 MB/s >30,000 IO/s
Disk Drive & Disk Enclosure Protocols Supported	Ultra3 SCSI and Ultra2 SCSI
User Interface	Controller display with Status Indicators (2) and Push Buttons (4) Status indicators on front of controller (16)
MSA1000 Controller Protocol support	2 Gb Fibre Channel
SCSI Ports	2 external VHDCI connectors standard for use for MSA30 disk enclosures
Logical Drives	Up to 32 logical drives
RAID Support	Raid ADG (Advanced Data Guarding) Raid 5 (Distributed Data Guarding) Raid 1+0 (Striping and Mirroring) Raid 1 (Mirroring) Raid 0 (Striping)

Models

DL380 Generation 4 (G4) Packaged Cluster (per DL380 Server) 374110-xx1	**Processor(s)**	(1) Intel Xeon Processor 3.4 GHz standard (up to 2 supported)
	Cache Memory	1-MB level 2 ECC cache
	Memory	1 GB (Standard) to 12 GB (Maximum) of 2 way interleaved capable PC2-3200 400MHz DDR2 SDRAM, with Advanced ECC capabilities
	Network Controller	(2) NC7782 PCI-X Gigabit NICs (embedded) PCI 10/100/1000 WOL (Wake on LAN)
	Storage Controller	Ultra320 Smart Array 6i controller (integrated on system board) (2) FCA2214 Host Adapter (Linux & 32-bit Windows)
	Hard Drives	None ship standard
	Internal Storage	1.8 TB (6 x 300 GB Ultra320 1") (with optional hard drives)
	Optical Drive	24x IDE CD-ROM Drive
	Modular Smart Array 1000	1 Modular Smart Array 1000 with 14 1" drive bays. Includes one MSA1000 Controller, redundant optional
	Form Factor	Rack (2U), (3.5-inch)

Country Code Key	XX=00	US
	XX=29	Japan
	XX=37	APD
	XX=42	EURO

Options (DL380 Generation 4 Packaged Cluster with MSA1000)

ProLiant DL380 G4 Unique Options (per server)	DL380 G4 Redundant Fan Option Kit	293048-B21
	NOTE: Hot Plug Redundant Fan Option Kit (PN 293048-B21) contains three fans.	
	Hot Plug AC Redundant Power Supply Module (NEMA and IEC cords) (NA and Japan)	355892-001
	Hot Plug AC Redundant Power Supply Module (IEC cord) (WW)	355892-B21
	Floppy Drive Option Kit	364507-B21
	SCSI Configuration Kit	364471-B21
	PCI-X Hot Plug Riser Cage Option Kit	354676-B21
	PCI-Express Riser Cage Option Kit	354675-B21
Processor	Intel Xeon 3.4 GHz-1MB	311583-B21
Memory (SDRAM DIMMs)	1GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2 x 512 MB)	343055-B21
	2GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2x1024 MB)	343056-B21
	4GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2x 2048 MB)	343057-B21
	NOTE: 4GB Kit will be delayed, availability is expected in 4Q04.	
Storage Rail Kit (Round Holes)	Round hole rack cabinet rail kit	293052-B21
	NOTE: Supports for racks with round mounting holes (including HP rack systems/E and HP systems), with an adjustment range of 24"- 36".	
	NOTE: The standard storage rails already support most square and round hole racks.	

Options (DL380 Generation 4 Packaged Cluster with MSA1000)

ProLiant Essentials Value Pack Software	Rapid Deployment Pack, 1 User, V1.x **NOTE:** This license allows 1 server to be managed and deployed via the Deployment Server. **NOTE:** Please see the following white paper to utilize Rapid Deployment on the Packaged Cluster: http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html	267196-B21
	Rapid Deployment Pack, 1 User, V1.x (Japan) **NOTE:** This license allows 1 server to be managed and deployed via the Deployment Server. **NOTE:** Please see the following white paper to utilize Rapid Deployment on the Packaged Cluster: http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html	267196-291
	Rapid Deployment Pack, 10 Users, V1.x **NOTE:** This license allows 10 servers to be managed and deployed via the Deployment Server. **NOTE:** Please see the following white paper to utilize Rapid Deployment on the Packaged Cluster: http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html	269817-B21
	Rapid Deployment Pack, 10 Users, V1.x (Japan) **NOTE:** This license allows 10 servers to be managed and deployed via the Deployment Server. **NOTE:** Please see the following white paper to utilize Rapid Deployment on the Packaged Cluster: http://h18004.www1.hp.com/solutions/enterprise/highavailability/whitepapers/index.html	269817-291
	ProLiant Essentials Integrated Lights-out advanced pack (featuring: sophisticated virtual administration)	263825-B21
	Performance Management Pack, single server **NOTE:** This license allows 1 server to be managed by Performance Management Pack.	306696-B21
	Performance Management Pack, flexible license kit **NOTE:** A single pack is shipped with a single license key for the total number of licenses ordered	306697-B21
	NOTE: Flexible and volume quantity license kits are available for ProLiant Essentials Value Packs. Refer to http://h18000.www1.hp.com/products/servers/proliantessentials/index.html or the various ProLiant Essentials Value Pack product QuickSpecs for more information. **NOTE:** For more information regarding ProLiant Essentials Software, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantessentials/index.html	
Communications	NC1020 Cu Gigabit Server Adapter 32 PCI Single Port	353377-B21
	NC6170 Dual Port PCI-X 1000SX Gigabit Server Adapter	313879-B21
	NC7170 Dual Port PCI-X 1000T Gigabit Server Adapter	313881-B21
	NC7771 PCI-X 10/100/1000-T Server Adapter	290563-B21
	HP NC150T PCI 4-port Gigabit Combo Switch Adapter	367132-B21
	HP NC320T PCI Express Gigabit Server Adapter	367047-B21
	NOTE: Any NIC (except the NC1020 and the NC150T) on the option list can be used for redundancy with the embedded NC7781 Network Controller. When teaming with other NICs or with the embedded NIC, the lack of Jumbo Frames and LSO features on the NC1020 and NC150T will cause high end NICs to have those features disabled. (e.g. incompatibility issues with the other option NICs for that platform).	
Redundant Options	Hot Plug AC Redundant Power Supply Module (NEMA cord) (NA)	355892-001
	Hot Plug AC Redundant Power Supply Module (IEC cord) (WW)	355892-B21
Optical Drives	Slimline DVD-ROM	264007-B21
	Slimline CD-RW/DVD-ROM Combo Option Kit	331903-B21

Options (DL380 Generation 4 Packaged Cluster with MSA1000)

Diskette Drives	Floppy Drive Option Kit	364507-B21
Hard Drives	**Ultra320 SCSI - Universal Hot Plug**	
	72.8-GB 10,000 rpm, U320 Universal Hard Drive, 1"	286714-B22
	146.8-GB 10,000 rpm, U320 Universal Hard Drive, 1"	286716-B22
	300-GB 10,000 rpm U320 Universal Hard Drive, 1"	350964-B22
	36.4-GB 15,000 rpm, U320 Universal Hard Drive, 1"	286776-B22
	72.8-GB 15,000 rpm, U320 Universal Hard Drive, 1"	286778-B22
	NOTE: All U320 Universal Hard Drives are backward compatible to U2 or U3 speeds. U320 drives require an optional U320 Smart Array Controller or U320 SCSI HBA to support U320 transfer rates.	
	NOTE: Please see the Hard Drive QuickSpecs for Technical Specifications such as capacity, height, width, interface, transfer rate, seek time, physical configuration, and operating temperature: U320 Hard Drive QS: http://h18000.www1.hp.com/products/quickspecs/11531_div/11531_div.HTML (Worldwide) http://h18000.www1.hp.com/products/quickspecs/11531_na/11531_na.HTML (North America)	
Modular Smart Array 1000 Options	MSA1000 High Availability Kit for Windows	353804-B21
	This convenient and affordable kit includes: - (1) MSA1000 Controller, with 256 MB cache - (1) MSA1000 SAN Switch 2/8 - (2) FCA2214 Host Adapters (Linux & 32-bit Windows) - (1) Secure Path software, Windows (2 server/F200 kits) - (2) Fibre Channel cable, 5m	
	MSA1000 High Availability Kit for Linux	353805-B21
	This convenient and affordable kit includes: - (1) MSA1000 Controller, with 256 MB cache - (1) MSA1000 SAN Switch 2/8 - (2) FCA2214 Host Adapters (Linux & 32-bit Windows) - (1) Secure Path software, Linux (2 server/F200 kits) - (2) Fibre Channel cable, 5m	
	MSA1000 Controller, with 256 MB cache	218231-B22
	MSA Fabric Switch 2/8	288247-B21
	FCA2214 Host Adapter (Linux & 32-bit Windows)	281541-B21
	256-MB Cache Module for MSA1000 Controller	254786-B21
	NOTE: Optional storage memory allows the following configurations: 1 X 256 MB (standard), 2 X 256 MB.	
	NOTE: When redundant controllers are installed, the cache configurations in both controllers must be identical.	
	HP StorageWorks Secure Path v4.0C for Windows Workgroup Edition	213076-B26
	HP StorageWorks Secure Path v3.0A for Linux Workgroup Edition	291536-B21
	ProLiant Cluster HA/F200 for MSA1000 for NT 4.0 and Windows 2000 (dual server, redundant path)	252409-B23

Options (DL380 Generation 4 Packaged Cluster with MSA1000)

HP StorageWorks Secure Path Optional Software

Secure Path is a family of high availability multi-pathing software products providing continuous data access from the MSA1000 to ProLiant servers running the Windows Server 2003, Windows 2000, Windows NT, Linux and NetWare operating systems.

Redundant hardware, advanced RAID technology and Secure Path's automated failover capability are used to enhance fault tolerance and availability. Secure Path effectively eliminates controllers, disk drives, interconnect hardware and host bus adapters as single points of failure in the storage subsystem.

The attachment of non-Secure Path (single HBA) servers to an MSA1000 with dual controllers that has servers with Secure Path (dual HBA) attached is supported where the operating systems are Windows or NetWare. Users must realize that in event of a controller fail-over (failure of active controller) the single path servers will lose access to their data on the MSA1000.

NOTE: If Secure Path for Linux is used on any node or cluster attached to an MSA1000, all nodes must also have Secure Path installed, regardless of operating systems.

NOTE: Refer to http://www.hp.com/go/securepath for the latest Secure Path parameters.

Key Features	Maintains connections to storage
	Monitors I/O paths and alerts on significant events
Used in	Stand alone Configurations
	Cluster configurations
	SAN configurations

Options

Secure Path v4.0B for Windows Workgroup Edition (including Windows Server 2003/32bit)	(Package includes separate programs for both the MSA1000 and the RA4000 and RA41000 solutions.)	
	Secure Path v4.0B for Windows Workgroup one license	213076-B25
	Secure Path v4.0B for Windows Workgroup Edition five licenses	231316-B25
	Secure Path v4.0B for Windows Workgroup Edition 10 licenses	231317-B25
	Secure Path v4.0B for Windows Workgroup Edition 25 licenses	231318-B25
	Secure Path v4.0B for Windows Workgroup Edition 50 licenses	231319-B25
	Secure Path v4.0B for Windows Workgroup Edition Upgrade License	261715-B23
	Secure Path v4.0B for Windows Workgroup Edition for ProLiant BL line 8 licenses (MSA1000 support for -BL servers coming mid-summer)	325634-B22
	NOTE: Refer to http://www.hp.com/go/securepath for the latest Secure Path parameters for NetWare.	
Secure Path v3.0 for Linux Workgroup Edition	Secure Path v3.0 for Linux Workgroup Edition one license	291536-B21
	Secure Path v3.0 for Linux Workgroup Edition five licenses	291537-B21
	Secure Path v3.0 for Linux Workgroup Edition 10 licenses	291538-B21
	Secure Path v3.0 for Linux Workgroup Edition 25 licenses	291539-B21
	Secure Path v3.0 for Linux Workgroup Edition 50 licenses	291540-B21
	NOTE: Refer to http://www.hp.com/go/securepath for the latest Secure Path parameters for NetWare.	
Management Options	Remote Insight Lights-Out Edition II (NA, LA)	227251-001
	Remote Insight Lights-Out Edition II (EMEA)	227251-021
	Remote Insight Lights-Out Edition II (ROW)	227251-371
Security	HP/Atalla AXL600L SSL Accelerator Card for ProLiant Servers	524545-B21
	Compaq AXL300 Accelerator PCI Card (HW SSL Encryption) for ProLiant Servers	227933-B21
Tape Drives	NOTE: External tape devices, including both tape drives and tape arrays/enclosures, can be directly connected to the VHDCI SCSI port located on the back of the server. Use of a SCSI adapter to connect these devices is optional, not required.	
	Hot Plug Tape Drives	
	HP StorageWorks DAT 40 Tape Drive, Internal Hot-Plug (Carbon)	Q1546A
	HP StorageWorks DAT 72 Tape Drive, Internal Hot-Plug (Carbon)	Q1529A
	External, Rack-Mount and Array Module Ultrium Tape Drives	
	HP StorageWorks Ultrium 215 Tape Drive, External (Carbon)	Q1545A
	HP StorageWorks Ultrium 215 rack-mount (Carbon) - Single drive installed in a 3U rack-mount kit	350544-B21
	HP StorageWorks Ultrium 215 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300	C7492B
	HP StorageWorks Ultrium 230 Tape Drive, External (Carbon)	Q1517A
	HP StorageWorks Ultrium 230, Rack-mount (Carbon) - Single drive installed in a 3U rack-mount kit	350545-B21
	HP StorageWorks Ultrium 230 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300	C7470B
	HP StorageWorks Ultrium 460 Tape Drive, External (Carbon)	Q1520A
	HP StorageWorks Ultrium 460, Rack-mount (Carbon) - Single drive installed in a 3U rack-mount kit	350546-B21
	HP StorageWorks Ultrium 460 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300	Q1512B
	NOTE: Please see the HP StorageWorks Ultrium 215, 230, and 460 Tape Drive QuickSpecs for additional options such as controllers, media, and other related items: http://h18006.www1.hp.com/products/quickspecs/11739_div/11739_div.html (Worldwide) http://h18006.www1.hp.com/products/quickspecs/11739_na/11739_na.html (North America)	
	For an up-to-date listing of the latest O/S and software support details for HP Ultrium tape drives,	

please visit: http://www.hp.com/go/connect

External, Hot-Plug, and Array Module DAT Drives

HP StorageWorks DAT 72 Tape Drive, External (Carbon)	Q1523A
HP StorageWorks DAT 72 Tape Drive, Internal Hot-Plug (Carbon)	Q1529A
HP StorageWorks DAT 72 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300	Q1524B
HP StorageWorks DAT 40 Tape Drive, External (Carbon)	C5687C
HP StorageWorks DAT 40 Tape Drive, Internal Hot-Plug (Carbon)	Q1546A
HP StorageWorks DAT 40 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300	C7497B
HP StorageWorks DAT 24e Tape Drive, External (Flint)	C1556D
HP StorageWorks DAT 24 Array Module (Carbon) - Offline hot-swap drive for Tape Array 5300	C7498A

NOTE: Please see the DAT Tape Drive QuickSpecs for controllers, media, and other options:
http://h18000.www1.hp.com/products/quickspecs/11883_div/11883_div.HTML (Worldwide)
http://h18000.www1.hp.com/products/quickspecs/11883_na/11883_na.HTML
(North America)
For an up-to-date listing of the latest O/S and software support details for HP DAT drives, please visit: http://www.hp.com/go/connect

External DLT VS Tape Drives

HP StorageWorks DLT VS80 Tape Drive, External (Carbon) NA	337699-B22
HP StorageWorks DLT VS80 Tape Drive, External (Carbon) Int'l	337699-B31
HP StorageWorks DLT VS80 Tape Drive, External (Carbon) Japan	337699-291

NOTE: Please see the DLT VS80 Tape Drive QuickSpecs for additional options such as host bus adapters, controllers, media, and other options:
http://h18006.www1.hp.com/products/quickspecs/11403_div/11403_div.HTML (Worldwide)
http://h18006.www1.hp.com/products/quickspecs/11403_na/11403_na.HTML
(North America)
For an up-to-date listing of the latest O/S and software support details for the DLT VS80, please visit: http://www.hp.com/go/connect

External SDLT Tape Drives

HP StorageWorks SDLT 320 Tape Drive, External (Carbon) NA	257319-001
HP StorageWorks SDLT 320 Tape Drive, External (Carbon) Int'l	257319-B31
HP StorageWorks SDLT 320 Tape Drive, External (Carbon) Japan	257319-291

NOTE: Please see the SDLT 320 Tape Drive QuickSpecs for additional options such as adapters, controllers, and media.
http://h18006.www1.hp.com/products/quickspecs/11840_div/11840_div.HTML (Worldwide)
http://h18006.www1.hp.com/products/quickspecs/11840_na/11840_na.HTML
(North America)
For an up-to-date listing of the latest O/S and software support details for HP SDLT tape drives, please visit: http://www.hp.com/go/connect

Rack-Mount Tape Drive Enclosures

HP StorageWorks 3U Rack-Mount Kit	274338-B21

NOTE: The 3U Rack-Mount Kit can support up to 2 full-height or 4 half-height tape drives and compatible with multiple Single-Ended and LVD SCSI tape drives including DAT, DLT VS80, SDLT 320, Ultrium 215, Ultrium 230, and Ultrium 460 Tape Drives.

HP StorageWorks 5U Rack-Mount Kit	274339-B21

NOTE: The 5U Rack-Mount Kit can support up to 4 full-height tape drives and is compatible with SDLT 320, Ultrium 230, and Ultrium 460 tape drives.

NOTE: Please see the Rack-Mount Tape Drive Kits QuickSpecs for additional information regarding these kits:
http://h18000.www1.hp.com/products/quickspecs/10854_div/10854_div.HTML (Worldwide)
http://h18000.www1.hp.com/products/quickspecs/10854_na/10854_na.HTML
(North America)

HP StorageWorks Tape Array 5300	C7508A

NOTE: The Tape Array 5300 is a 3U enclosure that supports up to 2 full-height or 4 half-height hot-swap array modules, including DAT and Ultrium tape drives. Cables and terminators are not

included and must be ordered separately.
NOTE: Please see the Tape Array 5300 QuickSpecs for additional information regarding this product.
http://h18000.www1.hp.com/products/quickspecs/11878_div/11878_div.HTML (Worldwide)
http://h18000.www1.hp.com/products/quickspecs/11878_na/11878_na.HTML (North America)

Accessories for 3U & 5U Rack-mount Tape Drive Kits

LVD Cable Kit, VHDCI/HD68	168048-B21
NOTE: For use with the 3U Rack-mount Kit and 5U Rack-mount Kit only.	
LVD Cable Kit, HD68/HD68	242381-B21
NOTE: For use with the 3U Rack-mount Kit and 5U Rack-mount Kit only.	

Accessories for 3U & 5U Rack-mount Tape Drive Kits

PSU/Fan Upgrade Kit - Redundant hot-swap power supply unit and fan for Tape Array 5300.

68-pin HD multi-mode terminator	C2364A
1.0m 68-pin VHDCI to 68-pin HD cable	C2361B
2.5m 68-pin VHDCI to 68-pin HD cable	C2362B
5.0m 68-pin VHDCI to 68-pin HD cable	C2365A
10.0m 68-pin VHDCI to 68-pin HD cable	C2363B
0.5m 68-pin HDI to 68-pin HD cable LVD/SE	C2978B
1.5m 68-pin HDI to 68-pin HD cable LVD/SE	C2979B
0.9m 68-pin HDI to 68-pin HD cable LVD/SE	C2911C
2.5m 68-pin HDI to 68-pin HD cable LVD/SE	C2924C

NOTE: For use with Tape Array 5300 only

Tape Autoloaders

DAT Autoloader

HP StorageWorks DAT 72x6 Tape Autoloader, External (Carbon)	Q1567A
HP StorageWorks DAT 40x6 Tape Autoloader, External (Flint)	C5717C

NOTE: Please see the DAT Tape Autoloader QuickSpecs at http://www.hp.com/go/tape for additional options such as host bus adapters, controllers and media.

HP StorageWorks 1/8 Tape Autoloader

1/8 Ultrium 460 Tape Autoloader, Tabletop	AA927A
1/8 SDLT 320 Tape Autoloader, Tabletop	AA926A
1/8 Ultrium 230 Tape Autoloader, Tabletop	C9572CB
1/8 DLT VS80 Tape Autoloader, Tabletop	C9264CB
1/8 Tape Autoloader Rack-mount Kit	C9268R

NOTE: Required to install the 1/8 tape autoloader in a standard 19-inch rack

NOTE: Please reference the 1/8 Tape Autoloader QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs

HP StorageWorks SSL1016 Tape Autoloader

SSL1016 Ultrium 460 Tape Autoloader	330821-B21
SSL1016 SDLT 320 Tape Autoloader	330816-B21

NOTE: Please reference the SSL1016 Tape Autoloader QuickSpecs at http://www.hp.com/go/automation for additional information needed to create a complete solution; reference current compatibility information at http://www.hp.com/go/ebs.

Options

External Storage	HP StorageWorks Modular Smart Array 30 SB	302969-B21
	HP StorageWorks Modular Smart Array 30 DB	302970-B21
	Ultra320 Dual Bus I/O Module for MSA 30	287483-B21
	Ultra320 Single Bus I/O Module for MSA 30	287484-B21
Cluster Options	HP Serviceguard for Linux ProLiant Cluster (2 node license cluster kit for Red Hat AS 2.1) A.11.14 NOTE: Kit includes 2 licenses, documentation and an Ethernet crossover cable.	305199-B22
	HP Serviceguard for Linux ProLiant Cluster (2 node license cluster kit) A.11.15 NOTE: Kit includes 2 licenses, documentation and an Ethernet crossover cable. NOTE: For additional information regarding the HP Serviceguard for Linux ProLiant Cluster, please see the following QuickSpecs at: http://h18000.www1.hp.com/products/quickspecs/11518_na/11518_na.html (North America) http://h18000.www1.hp.com/products/quickspecs/11518_div/11518_div.html (Worldwide)	305199-B24
	ProLiant Parallel Database Cluster for Linux - Oracle9i Real Application Cluster NOTE: For additional information regarding the ProLiant Parallel Database Cluster for Linux, please see the following QuickSpecs at: http://www5.compaq.com/products/quickspecs/11688_na/11688_na.html (North America) http://www5.compaq.com/products/quickspecs/11688_div/11688_div.html (Worldwide)	308225-B22
UPS and PDU Power Cord Matrix	***Please see the UPS and PDU cable matrix that lists cable descriptions, requirements, and specifications for UPS and PDU units:*** ftp://ftp.compaq.com/pub/products/servers/ProLiantstorage/power-protection/powercordmatrix.pdf.	
Uninterruptible Power Systems – Rack Mountable	UPS R1500 XR (1440VA, 1340 Watt), Low Voltage (NA)	204404-001
	UPS R1500 XR (1500VA, 1340 Watt), High Voltage (Int'l)	204404-B31
	UPS R1500 XR (1500VA, 1340 Watt), Low Voltage (Japan)	204404-291
	UPS R3000 XR (2880VA, 2700 Watt), Low Voltage (NA)	192186-001
	UPS R3000 XR (3000VA, 2700 Watt), High Voltage (NA)	192186-002
	UPS R3000 XR (2400VA, 2250 Watt), Low Voltage (Japan)	192186-291
	UPS R3000 XR (3000VA, 2700 Watt), High Voltage (Japan)	192186-292
	UPS R3000 XR (3000VA, 2700 Watt), High Voltage (Int'l - detachable cord)	192186-B31
	UPS R3000 XR (3000VA, 2700 Watt), High Voltage (16A IEC309 Plug)	192186-B32
	UPS R3000 XR (3000VA, 2700 Watt), High Voltage (16A CEE 7/7 SCHUKO Plug)	192186-B33
	UPS R3000 XR (3000VA, 2700 Watt), High Voltage (16A BS-546 Plug)	192186-AR1
	HP UPS R5500 XR (5000VA, 4500 Watt) High Voltage (NA/JPN)	326529-D71
	HP UPS R5500 XR (6000VA, 5400 Watt) High Voltage (Int'l)	326529-B31
	UPS R12000 XR N+x (200-240V) (WW-hardwired) NOTE: The UPS R12000 XR has a hardwired input and output; requires a 100A circuit.	207552-B22

Options

Modular PDUs 1U/0U

(Up to 32 outlets)
NOTE: 1U/0U mounting brackets shipped with the unit (optimized for 10000 and 9000 series racks).

HP Modular Power Distribution Units (mPDU), Low Volt Model, 24A (100-127 VAC) (NA, Japan)	252663-D71
NOTE: This mPDU (252663-D71) may also be used to connect the low volt model of the UPS R3000 XR.	
HP Modular Power Distribution Units (mPDU), High Volt Model, 24A (200-240 VAC) (NA, Japan)	252663-D72
HP Modular Power Distribution Units (mPDU), High Volt Model, 32A (200-240 VAC) (Int'l)	252663-B31
HP Modular Power Distribution Units (mPDU), High Volt Model, 40A (200-240 VAC) (WW)	252663-B21
NOTE: This mPDU (252663-B21), 40A model has a hardwired input.	
HP Modular Power Distribution Unit (mPDU), High Volt Model, 40A (200-240 VAC) (NA/JPN)	252663-D73
NOTE: This 40A mPDU's (252663-D73) has attached power cords.	
HP Modular Power Distribution Unit (mPDU), High Volt Model, 40A (200-240 VAC) (INTL)	252663-B32
NOTE: This 40A mPDU's (252663-B32) has attached power cords.	
HP Modular Power Distribution Units (mPDU), High Volt Model, 16A (200-240 VAC) (WW)	252663-B24
NOTE: This PDU has a detachable input power cord and allows for adaptability to country specific power requirements. This model may also be used with the high volt UPSs R3000 XR and R6000. For North America, need to order cable PN 340653-001.	
NOTE: Please see the following Modular Power Distribution Unit (Zero-U/1U Modular PDUs) QuickSpecs for additional options including shorter jumper cables and country specific power cords: http://h18000.www1.hp.com/products/quickspecs/11041_na/11041_na.HTML (North America) http://h18000.www1.hp.com/products/quickspecs/11041_div/11041_div.HTML (Worldwide)	

USB Options

USB Easy Access Keyboard (carbon)	267146-xx8

USB Easy Access Keyboard (Carbon) Country Key Code

Dash #	Description	Dash #	Description
-008	US	-178	Arabic
-038	UK	-188	Belgium
-048	Germany	-218	Hungary
-058	France	-228	Czech
-068	Italy	-238	Slovac
-078	Spain	-245	Polish
-088	Denmark	-258	Russian
-098	Norway	-298	Japan
-108	Sweden/Finland	-338	Dutch
-128	French Canadian	-358	Finish
-138	Portugal	-B38	Int'l
-148	Turkey	-B48	BHCSY
-155	Greek		

USB Easy Access Keyboard (carbonite)	DC168B#
USB 2-Button Scroll Mouse (carbon)	195255-B25
USB 2-Button Scroll Mouse (carbonite)	DD441B
USB Floppy (carbonite)	DC141B

Options

USB Easy Access Keyboard (Carbonite) Country Key Code

Dash #	Description	Dash #	Description
A2M	ICELAND	ABT	HE
AB0	TAWA	ABU	UK
AB1	KOR	ABV	ARA
AB2	PRC	ABX	FIN
AB6	FRA	ABY	DEN
AB7	GRK	ABZ	ITL
AB8	TURK	AC0	BEL
AB9	PORT	AC4	BRZ
ABA	US	ACB	RUSS
ABB	EURO	AKB	CZE
ABC	FCAN	AKC	HUNG
ABD	GR	AKD	POL
ABE	SP	AKL	THAI
ABF	FR	AKN	BHCSY
ABH	NL	AKR	SLOV
ABJ	Japan	ARK	ICELAND
ABM	LA	B15	KAZ
ABN	NOR	UUZ	SWISS
ABS	SW		

Custom Builder	Please see the Enterprise Configurator for configuration assistance at: http://www.hp.com/products/configurator	
HP Rack 5000 Series (Graphite Metallic)	HP 5642 Rack-Unassembled	358254-B21
Rack Options for Rack 5000 Series	Stabilizer Kit for 5642 Rack (Graphite Carbon) NOTE: The stabilizing kit is used to prevent rack from tipping over.	374493-B21
	Baying Kit for 5642 Rack (Graphite Carbon) NOTE: The baying kit is used to join two or more HP 5642 racks.	374499-B21

Options

HP Rack 10000 Series (Graphite Metallic)	HP Rack S10614 (14U) Rack Cabinet - Shock Pallet	292302-B22
	HP Rack 10842 (42U, 800mm wide) – Pallet	257415-B21
	HP Rack 10842 (42U, 800mm wide) – Shock Pallet	257415-B22
	HP Rack 10647 (47U) – Pallet	245160-B21
	HP Rack 10647 (47U) – Crated	245160-B23
	HP Rack 10642 (42U) – Pallet	245161-B21
	HP Rack 10642 (42U) – Shock Pallet	245161-B22
	HP Rack 10642 (42U) – Crated	245161-B23
	HP Rack 10636 (36U) – Pallet	245162-B21
	HP Rack 10636 (36U) – Shock Pallet	245162-B22
	HP Rack 10636 (36U) – Crated	245162-B23
	HP Rack 10622 (22U) – Pallet	245163-B21
	HP Rack 10622 (22U) – Shock Pallet	245163-B22
	HP Rack 10622 (22U) – Crated	245163-B23
	NOTE: -B21 (pallet) used to ship empty racks shipped on a truck -B22 (shock pallet) used to ship racks with equipment installed (by custom systems, VARs and Channels) -B23 (crated) used for air shipments of empty racks	
	NOTE: It is mandatory to use a shock pallet in order to ship racks with equipment installed. Not all Compaq equipment is qualified to be shipped in the Rack 10000 series.	
	NOTE: Please see the Rack 10000 QuickSpecs for Technical Specifications such as height, width, depth, weight, and color: http://h18000.www1.hp.com/products/quickspecs/10995_div/10995_div.HTML (Worldwide) http://h18000.www1.hp.com/products/quickspecs/10995_na/10995_na.HTML (North America)	
	NOTE: For additional information regarding Rack Cabinets, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/racks/index.html.	
Rack Options for HP Rack 10000 Series	HP Rack Light Kit (Neon)	361589-B21
	HP Rack Plinth Kit (Carbon)	251960-B21
	42U Side Panel – Graphite Metallic	246099-B21
	36U Side Panel – Graphite Metallic	246102-B21
	47U Side Panel – Graphite Metallic	255486-B21
	NOTE: For additional information regarding Rack Options, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html.	
	KVM USB Interface Adapter	336047-B21
	Server Console Switch 1 x 4 port (100-230 VAC)	400336-001
	Server Console Switch, 0 x 1 x 8 port	336044-B21
	Server Console Switch, 0 x 2 x 16 port	336045-B21
	Server Console Switch 1 x 4 port (100-230 VAC) (Int'l)	400336-B31
	Server Console Switch 1 x 4 port (100-230 VAC) (Japan)	400336-291
	IP Console Switch Box, 1 x 1 x 16	262585-B21
	IP Console Switch Box, 3 x 1 x 16	262586-B21
	IP Console Interface Adapter, 8 pack	262587-B21
	IP Console Interface Adapter, 1 pack	262588-B21
	IP Console Expansion Module	262589-B21
	CPU to Server Console Cable, 12'	110936-B21
	CPU to Server Console Cable, 3'	110936-B24
	CPU to Server Console Cable, 7'	110936-B25
	IP CAT5 Cable 3', 4 pack	263474-B21
	IP CAT5 Cable 6', 8 pack	263474-B22

Options

IP CAT5 Cable 12', 8 pack	263474-B23
IP CAT5 Cable 20', 4 pack	263474-B24
IP CAT5 Cable 40', 1 pack	263474-B25
Switch Box Connector Kit (high voltage) (Int'l)	144007-B33
TFT5600 Rack Keyboard Monitor	221546-xx1

Country Code Key *(for TFT5600 Rack Keyboard Monitor (PN 221546-xx1))*

XX = 001	US	XX = 091	Norway
XX = 031	UK	XX = 101	Sweden/Finland
XX = 041	Germany	XX = 111	Switzerland
XX = 051	France	XX = 131	Portugal
XX = 061	Italy	XX = 181	Belgium
XX = 071	Spain	XX = 291	Japan
XX = 081	Denmark	XX = B31	International

1U Rack Keyboard & Drawer (Carbon) 257054-xx1

Country Code Key *(for 1U Rack Keyboard & Drawer (PN 257054-xx1))*

XX = 001	US	XX = 091	Norway
XX = 031	UK	XX = 101	Sweden/Finland
XX = 041	Germany	XX = 111	Switzerland
XX = 051	France	XX = 131	Portugal
XX = 061	Italy	XX = 181	Belgium
XX = 071	Spain	XX = 291	Japan
XX = 081	Denmark	XX = B31	International

NOTE: For additional information regarding Rack Options, please see the following URL: http://h18000.www1.hp.com/products/servers/proliantstorage/rack-options/index.html.

Rack Options for Third Party Cabinet Racks

Input Device Telco Rails NOTE: Input Device Telco Rails (287138-B21) are for use ONLY with the TFT5110R, TFT5600RKM and integrated keyboard/drawer which is used in mounting into third party racks.	287138-B21
Round hole rack cabinet rail kit NOTE: Support for racks with round mounting holes (include HP Rack System /E and HP Systems) with an adjustment range of 24"- 36".	293052-B21

Options

Service and Support Offerings (HP Care Pack Services)

NOTE: The DL380 Packaged Cluster Care Pack services cover the two DL380 servers and the external storage component.

Hardware Services 4-Hour On-site Service	
4-Hour On-site Service, 13-Hour x 5-Day Coverage, 3 Years	U4560A
4-Hour On-site Service, 13-Hour x 5-Day Coverage, 3 Years, Electronic	U4560E
4-Hour On-site Service, 24-Hour x 7-Day Coverage, 3 Years	U4561A
4-Hour On-site Service, 24-Hour x 7-Day Coverage, 3 Years, Electronic	U4561E
Installation & Start-up Services	
Hardware Installation	U4570A
Hardware Installation, Electronic	U4570E
Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays.	U2870A
Installation & Start-Up of a ProLiant server and Microsoft or Linux O/S per the Customer Description and/or Data Sheet. To be delivered on a scheduled basis 8am-5pm, M-F, excl. HP holidays, Electronic	U2870E
W2K AS Cluster Configuration HP Care Pack	
Install & Configure MS Windows 2000 Advanced Sever Cluster software on a cluster	U5701A
Install & Configure MS Windows 2000 Advanced Sever Cluster software on a cluster, Electronic	U5701E
Support Plus	
Onsite HW support, 8am-9pm, M-F, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays.	U4571A
Onsite HW support, 8am-9pm, M-F, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 8am-9pm, M-F 2hr response time excl. HP holidays, Electronic	U4571E
Support Plus 24	
Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays.	U4572A
Onsite HW support 24x7, 4hr response and Microsoft O/S SW Tech support offsite, onsite at HP's discretion, 24x7 2hr response time incl. HP holidays, Electronic	U4572E
24-Hour x 7-Day, 6-hour Call To Repair, 3 Years	U4562A
24-Hour x 7-Day, 6-hour Call To Repair, 3 Years, Electronic	U4562E

NOTE: For more information, customer/resellers can contact http://www.hp.com/hps/

Memory

HP ProLiant DL380 G4 Packaged Cluster with Modular Smart Array 1000

Standard Memory

1 GB PC2 PC3200 DDR2 SDRAM running at 400MHz comes installed (2 x 512-MB SDRAM)

Standard Memory Plus Optional Memory

Up to 5,120-MB memory is available with the optional installation of PC2 PC3200 DDR2 SDRAM running at 400MHz memory kits.

Standard Memory Replaced with Optional Memory

Up to 6,144-MB memory is available with the removal of the standard 1-GB of memory and the optional installation PC2 PC3200 DDR2 SDRAM running at 400MHz memory option kits.

NOTE: Chart does not represent all possible configurations.

Memory		Slot					
		1	2	3	4	5	6
Standard	1,024 MB	512 MB	512 MB	Empty	Empty	Empty	empty
Optional	5,120 MB	512 MB	512 MB	1024 MB	1024 MB	1024 MB	1024 MB
Maximum	6,144 MB	1024 MB	1024 MB	1024 MB	1024 MB	1024 MB	1024 MB

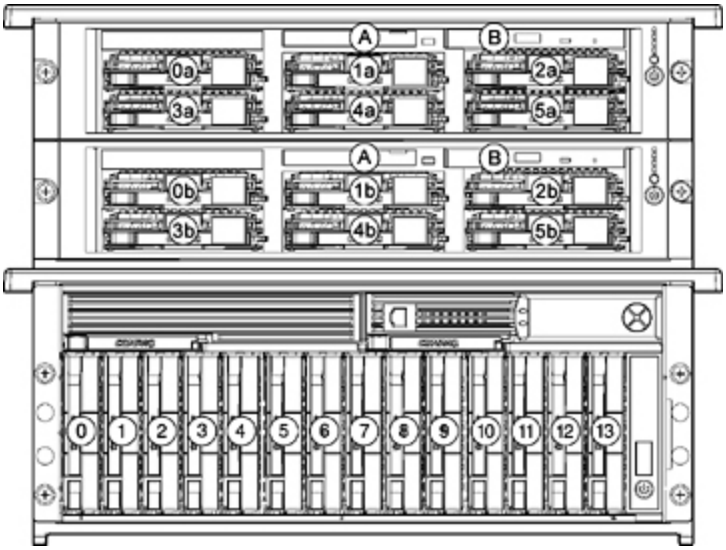
NOTE: Slots 3 and 6 can be configured as online spare memory through RBSU.

Following are memory options available from HP:

- 1GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2 x 512 MB) 343055-B21
- 2GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2x1024 MB) 343056-B21
- 4GB of Advanced PC2 PC3200 DDR2 SDRAM DIMM Memory Kit (2x 2048 MB) 343057-B21

NOTE: 4GB Kit will be delayed. Availability is expected in 4Q04.

Storage



0a - 5a	Six 1" Wide Ultra320 SCSI hot plug hard drive bays
0b-5b	Six 1" Wide Ultra320 SCSI hot plug hard drive bays
0-13	Fourteen 1" Wide Ultra320 SCSI hot plug drive bays
A	Optional 1.44-MB Diskette Drive
B	24x IDE CD-ROM (Slimline) NOTE: Only a CD-ROM drive is qualified for use in the MultiBay slot.
0a & 0b (or any pair of shared storage from 1-13)	Convertible 1.6" drive bay - supports either (1) 1" Hot Plug Drive or (1) 1.6" AIT or 20/40/100-GB DAT Hot Plug Tape Drive

Drive Support

	Quantity Supported	Position Supported	Controller
1.44-MB Diskette Drive	Up to 1	a	Integrated
IDE CD-ROM Drive	Up to 1	b	Integrated IDE

Hard Drives

Ultra320 Hot Pluggable Drives

	Quantity Supported	Position Supported	Controller
1-inch	Up to 26	0a-5a, 0b-5b, 0-13	
300-GB 10,000 rpm			Smart Array 6i Controller (integrated on system board)
146.8-GB 10,000 rpm			MSA1000 Controller, with 256 MB cache
72.8-GB 10,000 rpm			64-Bit/133Mhz Dual Channel Ultra320 SCSI Adapter
72.8-GB 15,000 rpm			64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
36.4-GB 15,000 rpm			FCA2214 Host Adapters (Linux & 32-bit Windows)

NOTE: All U320 Universal Hard Drives are backward compatible to U2 or U3 speeds. U320 drives require an optional U320 Smart Array Controller or U320 SCSI HBA to support U320 transfer rates.

Maximum Storage Capacity – (ProLiant DL380 G4, per server)

Internal	1.8 TB (6 x 300 GB Ultra320 1")
Total	1.8 TB

Maximum Shared Storage Capacity (Modular Smart Array 1000)

Internal	4.2 TB (14 x 300 GB Ultra320 1")
With one MSA30 disk enclosure	8.4 TB (28 x 300 GB Ultra320 1")
With two MSA30 disk enclosures	12.6 TB (42 x 300 GB Ultra320 1")

NOTE: Additional MSA30 disk enclosures must be purchased separately and not fit into the 8U Packaged Cluster fixture. MSA30 disk enclosures must be installed in an HP rack with the DL380 Packaged Cluster with MSA1000. MSA30 disk enclosures may be purchased as tower models, as well.

Tape Drives

NOTE: For an up-to-date listing of the latest O/S Support details for each of the Tape Drives listed below, please see the following:
http://www5.compaq.com/products/quickspecs/North_America/10233.html (North America)
http://www5.compaq.com/products/quickspecs/Division/10233.html (Worldwide)

	Quantity Supported	Position Supported	Controller
HP StorageWorks DAT 40 Tape Drive, Internal Hot-Plug HP StorageWorks DAT 72 Tape Drive, Internal Hot-Plug	1 (per server)	0a, 0b	Smart Array 5i Controller (integrated on system board)
Ultrium 215, External Ultrium 230, External Ultrium 460, External	External	N/A	64-Bit/133Mhz Dual Channel Ultra320 SCSI Adapter 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
HP StorageWorks DAT 72 Tape Drive, External HP StorageWorks DAT 40 Tape Drive, External HP StorageWorks DAT 24 Tape Drive, External	External	N/A	64-Bit/133Mhz Dual Channel Ultra320 SCSI Adapter 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
HP StorageWorks DLT VS80 Tape Drive, External	External	N/A	64-Bit/133Mhz Dual Channel Ultra320 SCSI Adapter 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
HP StorageWorks SDLT 320 Tape Drive, External	External	N/A	64-Bit/133Mhz Dual Channel Ultra320 SCSI Adapter 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS
HP StorageWorks DAT 40x6 Tape Autoloader, External	External	N/A	64-Bit/133Mhz Dual Channel Ultra320 SCSI Adapter 64-Bit/66-MHz Dual Channel Wide Ultra3 SCSI Adapter, Alternate OS

Power Specifications

Part Number	194989-001
Spare Kit	19982-B21
Operational Input Voltage Range (Vrms)	90 to 264
Frequency Range (Nominal) (Hz)	47 to 63 (50/60)

Nominal Input Voltage (Vrms)	100	115	208	220	230	240
Max Rated Output Wattage Rating	400	400	400	400	400	400
Nominal Input Current (Arms)	5.8	5.0	2.7	2.5	2.4	2.3
Max Rated Input Wattage Rating (Watts)	571	563	548	541	541	541
Max. Rated VA (Volt-Amp)	583	575	559	552	552	552
Efficiency (%)	70	71	73	74	74	74
Power Factor	0.98	0.98	0.98	0.98	0.98	0.98
Leakage Current (mA)	0.31	0.36	0.65	0.69	0.72	0.75
Maximum Inrush Current (A peak)	50	50	50	50	50	50
Maximum Inrush Current duration	20	20	20	20	20	20

NOTES:
* To review typical system power ratings use the Active Answers Power Calculator which is available via the online tool located at URL: http://h30099.www3.hp.com/configurator/powercalcs.asp.

To drill down to calculators:
- Click on: "ProLiant Servers"
- Click on the Server of interest. Example: DL380 G4 Packaged Cluster
- Click on: "Power Calculator" link. (You may need to scroll down to see it)

Power Cords (13 Cord Sets)	
Country	Power Cord Part Number
APD	139867-006
APD	100613-003
APD	100614-003
Australia	100611-007
Europe	100614-003
France	100614-003
Germany	100614-003
Japan	139867-006
PRC	139867-006
PRC	100613-003
PRC	100661-007
UK	100613-003
US	163719-002

Modular Smart Array Cluster Storage Power Specification

Nominal Input Voltage (Vrms)	100V 60 Hz	120V 60 Hz	208 60 Hz	220V 50 Hz	240V 50 Hz
Nominal Input Current(Vrms)	4.50	3.69	2.08	1.97	1.80
Nominal Input Current (Watt)	448	442	429	428	427
Maximum Input Current (Vrms)	6.73	5.47	3.05	2.88	2.63
Maximum Input Current (Watt)	669	654	630	628	626
Efficiency (ratio of DC output to real input power at 499 Watts)	0.73	0.73	0.78	0.78	0.78
Inrush Current	65 Amps	65 Amps	65 Amps	65 Amps	65 Amps

Technical Specifications

System Unit - DL380 G4 Server	**Dimensions** (HxWxD)	3.38 x 17.5 x 25.75 in (8.59 x 44.45 x 65.40 cm)	
	Weight	Maximum:	60 lb (27.22 kg)
		No drives:	47.18 lb (20.41 kg)
	Input Requirements (per power supply)	Range Line Voltage	100 to132 VAC/180 to 265 VAC
		Rated Input Current	7.5A (100VAC) to 3.8A (200VAC)
		Rated Input Frequency	50 to 60 Hz
		Rated Input Power	735W
	BTU Rating	2,508 BTU/HR	
	Power Specifications	To review typical system power ratings use the Active Answers Power Calculator which is available via the online tool located at URL: http://h30099.www3.hp.com/configurator/calc/Power%20Calculator%20Catalog.xls To drill down to calculators: - Click on: "ProLiant Servers" - Click on the Server of interest. Example: DL380 G4 Packaged Cluster - Click on: "Power Calculator" link. (You may need to scroll down to see it)	
	SCSI Connectors	One external VHDCI connector	
	Power Supply Output Power (per power supply)	Rated Steady-State Power	575W
		Maximum Peak Power	57W
	Temperature Range	Operating	50° to 95° F (10° to 35° C)
		Shipping	-22° to 122° F (-30° to 50° C)
	Relative Humidity (non-condensing)	Operating	10% to 90%
		Shipping	5% to 95%
	Maximum Wet Bulb Temperature	82.4° F (28° C)	
	Acoustic Noise	Idle (Fixed Disk Drives Spinning)	
		L WAd (BELS)	7.4
		L pAm (dBA)	58
		Operating (Random Seeks to Fixed Disks)	
		L WAd (BELS)	7.4
		L pAm (dBA)	58

Packaged Cluster	**Dimensions**	16 x 21 x 29 in (17.5 x 48.3 x 52.1 cm)	
	Weight	Standard Configuration (No drives dual power supplies)	190 lb (86.18 kg)

Low-Profile 24X Max IDE CD-ROM Drive	**Disk**	Applicable Disk	CD-DA, CD-ROM (Mode 1 and 2) CD-XA, CD-I (Mode 2, Form 1 and 2) CD-I Ready, CD Extra, Video CD, CD-Bridge Photo CD (Single and Multi-session) CD-WO
		Capacity	550 MB (Mode 1, 12 cm) 640 MB (Mode 2, 12 cm)
		Diameter	4.7 x 3.15 in (12 x 8 cm)
		Rotational Speed	4200 rpm maximum
		Center Hole	0.6 in (15 mm) diameter
		Thickness	1.2 mm
		Track Pitch	1.6 μm
	Block Size	Mode 0	2,368, 2,352 bytes
		Mode 1	2,352, 2,340, 2,336, 2,048 bytes
		Mode 2	2,352, 2,340, 2,336, 2,048 bytes
	Interface	IDE (ATAPI)	
	Access Times (typical)	Random	< 140 ms
		Full-Stroke	< 300 ms
	Data Transfer Rate	Sustained	150 KB/s (sustained 1X)
		Burst	2100 to 4800 KB/s
	Cache Buffer	128 KB	
	Start-up Time (typical)	< 10 seconds	
	Stop Time	< 5 seconds	
	Operating Conditions	Temperature	41° to 120° F (5° to 55° C)
		Humidity	10% to 80%
	Dimensions	(H x W x D, maximum)	0.51 x 5.24 x 5.2 in (1.30 x 13.31 x 13.21 cm)
		Weight	< 340 g

Integrated Smart Array 6i Plus Controller	Data Compatible with all Smart Array Controllers	Yes
	Instant Upgrades to other Smart Array Controllers	Yes
	Consistent Software Manageability Tools	Yes
	PCI-X Bus	64-bit, 133 MHz (integrated on system board)
	PCI-X Peak Data Transfer Rate	800 MB/s
	SCSI Protocols Supported	Ultra320, Ultra3, Ultra 2
	SCSI Peak Data Transfer Rate	320 MB/s per channel NOTE: For ProLiant servers having TWO internal drive bays on separate SCSI ports: SCSI Peak Data Transfer Rate is 320 MB/s total; 160 MB/s per channel and Channels is 2.
	Channels	2 NOTE: For ProLiant servers having two internal drive bays on separate SCSI ports: SCSI Peak Data Transfer Rate is 320 MB/s total; 160 MB/s per channel and Channels is 2.
	SCSI Ports (external/internal)	0/2 NOTE: For ProLiant servers having two internal drive bays on separate SCSI ports: SCSI Peak Data Transfer Rate is 320 MB/s total; 160 MB/s per channel and Channels is 2.
	Drives Supported (maximum)	Maximum = total number of drives NOTE: Maximum is the total number of internal drives on each specific ProLiant server.
	Cache	64 MB Read and/or Write Cache
	Battery-Backed Write Cache	Yes, with installation of Battery-Backed Write Cache Enabler, up to 64MB
	RAID Support	0, 1, 1+0, 5
	Logical Drives (maximum)	Maximum = total number of drives
	Online Configuration	Yes
	Online Capacity Expansion	Yes
	Logical Drive Capacity Extension	Yes
	Online Stripe Size Migration	Yes
	Online RAID Level Migration	Yes
	Online Spare Support	Yes
	Automatic Data Recovery	Yes
	Drive Roaming	Yes
	Redundant Controllers	No

NC7782 Dual PCI-X Gigabit NIC (embedded) 10/100/1000 WOL (Wake On LAN)	Network Interface	10Base-T/100Base-TX/1000 BaseTX	
	Compatibility	IEEE 802.3/802.3u compliant	
	Data Transfer Method	64-bit bus-master PCI-X	
	Network Transfer Rate	10Base-T (Half-Duplex)	10 Mb/s
		10Base-T (Full-Duplex)	20 Mb/s
		100Base-TX (Half-Duplex)	100 Mb/s
		100Base-TX (Full-Duplex)	200 Mb/s
		1000Base-TX (Half-Duplex)	1000Mb/s
		1000Base-TX (Full-Dupplex)	2000 Mb/s
	Connector	RJ-45	
	Cable Support	10Base-T	Categories 3, 4 or 5 UTP; up to 328 ft (100 m)
		100Base-TX	Category 5 UTP; up to 328 ft (100 m)
		1000Base-TX	Category 5 UTP; up to 328 ft (100 m)

Modular Smart Array 1000	**LED Indicators on Front** (3)	Power	
		Fault detected in one or more sub-systems	
		Fault in Enclosure Management	
	LED Indicators for Drive Modules (3)	Drive Access (center)	
		Online (left)	
		Drive Failure (right)	
	LED Indicators on Rear Panel (4)	Power Supply/Blower Assembly Fault (1)	
		EMU (3) Power, A bus, B bus	
	Interface	Ultra3 SCSI to Hard Drives	
		2 Gb Fibre Channel to Hosts	
	Maximum Number of Drives	Fourteen, 1-inch HP Ultra2, Ultra3 or Ultra320 Universal Hard Drives (MSA1000 Cabinet); expandable to 42 using two additional HP StorageWorks 4200/4300 Enclosures	
	Temperature Range	**Operating**	50° to 95° F (10° to 35° C)
		Shipping	-22° to 122° F (-30° to 50° C)
			NOTE: Derated 1° C per 1,000 ft of elevation to 10,000 ft.
	Relative Humidity	**Operating**	10% to 90%
		Non-operating	Up to 95%
	Input Power Requirements	**Rated Input Voltage**	100 to 240 VAC
		Rated Input Frequency	50 to 60 Hz
		Rated Input Current	6 A Max
		Input Power (max)	549 W*
	Heat Dissipation (max)	1876 Btu/hr*	
		NOTE: Input Power and Heat Dissipation specifications are maximum values and apply to worst-case conditions at full rated power supply load. The power/heat dissipation for your installation will vary depending on the equipment configuration.	
	MSA1000 Cabinet	4U Rack Form Factor	
		Dimensions (H x W x D)	6.9 x 19 x 20.5 in (17.5 x 48.3 x 52.1 cm)
		Weight	Net 55 to 85 lb (24.95 to 38.56 kg)
	User Interface	Controller display with Status Indicators (2) and push buttons (4) on front of controller	
	Electrical Interface	LVD (Low Voltage Differential)	
	Protocol Support	Wide Ultra3 SCSI	
	SCSI Ports	4-channel: 2 internal, 2 external	
	Drives Supported	Up to 42 drives	
	Maximum Capacity	6TB (42 drives x 146GB)	
	Logical Drives (LUN)	Up to 32 Logical Drives	
	Maximum Logical Drive size	2.0TB	

Modular Smart Array 1000 Controller	**User Interface**	Controller Display with Status Indicators (2) and Push Buttons (4) Status Indicators on front of Controller (16)	
218231-B22	**Electrical Interface**	LVD (Low Voltage Differential)	
	Protocol Support	Wide Ultra3 SCSI (160 MB/s per channel)	
	SCSI Ports	4-channel: 2 external/2 Internal	
	Drives Supported	Up to 42 drives	
	Maximum Capacity	6.0 TB (42 drives x 146 GB)	
	Logical Drives	Up to 32 logical drives	
	RAID Support	RAID ADG (Advanced Data Guarding)	
		RAID 5 (Distributed Data Guarding)	
		RAID 1+0 (Striping & Mirroring)	
		RAID Support	
	Cache Memory	Up to 512 MB Read/Write (256 MB modules). If redundant controllers are used they must have equally configured cache	
		ECC protection, battery-backed, and removable	
		Standard as of November 19, 2002: 256 MB cache memory (single module)	
	Cache Batteries	Up to three days of redundant battery life, removable for easy replacement	
	Upgradeable Firmware	2 MB flashable ROM	
	Disk Drive and Enclosure Protocol Support	HP Ultra320, Ultra3, and Ultra2 SCSI 1-inch Universal drives	
	Temperature Range	**Dimensions** (L x W x D)	17 x 12.5 x 7.75 in (43.2 x 31.75 x 19.7 cm)
		Weight (Gross)	6 lb (2.72 kg)

MSA Fabric Switch 2/8 288247-B21	**Performance**	2.125 Gbit/sec line speed, full duplex ;1.063 Gbit/sec line speed, full duplex; Auto-sensing of 1 Gbit/sec and 2 Gbit/sec port speeds; optionally programmable to fixed port speed; Speed matching between 1 Gbit/sec and 2 Gbit/sec ports Aggregate bandwidth 64 Gbit/sec end to end Fabric latency <2.1 µsec with no contention, cut-through routing at 2 Gbit/sec	
	Interoperability (NOTE: Products listed may be discontinued.)	SAN Switch 2/8-EL, SAN Switch 2/16-EL, SAN Switch 2/32, SAN Switch 2/64, SAN Switch 8, SAN Switch 16, SAN Switch 8-EL, SAN Switch 16-EL, Integrated/32, Integrated/64	
	Switch bandwidth	32 Gbit/sec end to end	
	Maximum frame size	2112-byte payload	
	Port types	8 ports universal (one internal, seven external), FL_Port, F_Port, and E_Port; self-discovery based on switch type (U_Port)	
	Media types	Small form-factor pluggable (SFP) four included standard; short wavelength (SWL) up to .31 mi (500m), long wavelength (LWL) up to 21 mi (35 km); distance depends on fiber-optic cable and port speed	
	Classes of service	Class 2, Class 3, Class F (inter-switch frames)	
	Management access	10/100 Ethernet port (RJ-45); Serial port (RS-232)	
	Management	Advanced Web Tools included; Fabric Manager (optional) Management access In-band via Management Server.	
	Security	Fabric security for configuration management, SAN access, and authentication/authorization	
	Supported software	Telnet, SNMP, WEBTOOLS, Zoning, Fabric Watch, Extended Fabrics, Remote Switch, Trunking, Advanced Performance Monitoring	
	Fabric services	Simple Name Server, Registered State Change Notification (RSN), Alias Server (multicast); and Zoning, WEB TOOLS. Optional QuickLoop, Fabric Watch, Extended Fabrics, and Remote Switch, Trunking, Advanced Performance Monitoring	
	Diagnostics	Diagnostics POST and embedded online/offline diagnostics	
	Dimensions (H x Wx D)	SAN Switch 2/8: 7.75 x 12.5 x 17 in (19.68 x 31.75 x 43.18 cm)	
	Shipping	6 lb (2.72.kg)	
	Humidity range	5% to 85% non-condensing at 104° F (40° C)	
	Environment	**Temperature**	**Operating** 32° F to 104° F (0° C to 40° C)
			Non-operating -31° F to 147° F (-25° C to 70° C)
		Vibration	**Operating** 0.5 G p-p, 5-500 Hz
			Non-operating 2.0 G p-p, 5-500 Hz
	Connector Type	LC	
	Protocol	SCSI, IP	
	Data Transfer Method	64-bit/66 MHz PCI	
	Maximum Transfer Rate	200 MB	
	Packaging	**Dimensions** (L x W x D)	11 x 8.5 x 3 in (27.9 x 21.6 x 7.6 cm)
		Weight (Gross)	1 lb (0.45 kg)

Multi-Mode Fibre Channel Cables Kits 218960-B21	**Cable Type**	LC-LC (2 Gb to 2 Gb connections) and LC-SC (2 Gb to 1 Gb connections) 50 Micron multi-mode Fiber	
	Available Cable Lengths	6.5 ft, 16.4 ft, and 49.2 ft (2 m, 5 m, and 15 m)	
	Packaging	**Dimensions** (L x W x D)	11.5 x 9 x 1.5 in (29.2 x 22.8 x 3.8 cm)
		Weight (Gross)	0.75 to 1 lb (0.34 to 0.45 kg)

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